Air Quality
Performance Test Guidelines

Kansas Department of Health and Environment
Bureau of Air and Radiation

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1. INTRODUCTION

The purpose of this document is to provide guidance for companies and individuals conducting air quality performance tests for a compliance demonstration in the State of Kansas. It is intended to serve as a reference guide. This guidance will assist in planning and preparing for testing, conducting the test, and preparing a complete and accurate report. With the assistance of this document, consistent quality and documentation for such tests can be obtained.

This guidance is not intended to supersede any specific requirements of the Environmental Protection Agency's (EPA's) Test Methods. Nor does it relieve a facility or the contracted test company from fulfilling their obligations as described by their permit and the applicable county, state, and/or federal rules and regulations. This guidance should be utilized as a means to improve the process of planning, conducting, and reporting performance tests. Many of the concepts underlying this guidance come from the EPA's "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III. Stationary Sources Specific Methods," document number EPA/600/R-94/038c, dated April 1994. Test companies are encouraged to become familiar with this document. KDHE also encourages stack testing companies and companies required to conduct performance tests to become familiar with the National Stack Testing Guidance, which can be found at:

http://www.4cleanair.org/members/committee/permits/EPADraftStackTestingGUIDANCE.pdf

Companies should also review Preparation and Review of Site Specific Test Plans (GD 42), and Preparation and Review of Emission Test Reports (GD 43), which can be found at:

http://www.epa.gov/ttn/emc/guidlnd.html

2. TEST PLANNING

The purpose of performance tests (a.k.a. source tests, compliance tests or stack tests) is to extract from a stack or emission point a sample that is representative of emissions from that equipment during representative operating conditions at the facility. For compliance determinations, representative conditions may include a worst-case scenario that will allow the facility to demonstrate compliance at all times of operation.

2.1 EPA Test Methods - The EPA Test Methods are designed to provide representative and reliable data. EPA Test Methods are found in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A. Continuous emission monitor (CEM) performance specifications are located in 40 CFR Part 60, App B. Additional EPA Test Methods may be found in other sections of the CFR, such as Part 51, Appendix M and Part 63, Appendix A. Adherence to these standardized procedures for sampling and analyses is essential. Documentation of tests by maintaining complete and accurate records is of utmost importance.

2.2 Test Protocols - Testing shall not be conducted without an approved test protocol as required in the facility's permit conditions. The test protocol is a complete description of the production processes and associated operating parameters, proposed test methods, and specific details about the sampling site. Any proposed deviations (minor modifications) from the Federal Reference Testing Methods must also be included under separate letterhead for approval. Postponement of the test, or rejection of the test results, may occur if the test method requirements are not met. The facility and test company shall both identify a representative who

will participate in coordinating the test. The facility representative shall be able to identify all of the process and control equipment parameters needed to establish the system's operating conditions during testing. It is recommended that an on-site pre-test survey be performed with the test company to establish stack dimensions, sample port locations or installation requirements, scaffolding or lift equipment requirements, electrical power requirements, operating conditions and safety requirements and procedures. Any nonscheduled maintenance or changes should be avoided for two weeks before the test for system stabilization. The facility should also confirm stack accessibility by removing caps from sample ports and verify that all monitoring instrumentation is installed and working properly. Attachment 1 identifies the minimum documentation that the Department will require in a test protocol. The protocol should follow this format and input should be provided for each item to assure protocol approval. The test protocol shall be submitted at least 30 calendar days prior to the test unless otherwise specified in permit conditions or regulations. The Department shall be notified of the actual test date and time at least 14 calendar days prior to the test. KDHE accepts notifications and protocols in the form of hard copy, e-mail, and fax.

2.3 Confidentiality Claims - Any confidentiality claims shall be accompanied by a notice of confidentiality pursuant to K.S.A. 65-3015 that precisely identifies the information that is considered confidential. The notice shall contain sufficient supporting information to allow the Department to evaluate whether such information satisfies the requirements related to trade secrets or how the information could cause substantial harm to the facility's competitive edge. If claiming confidentiality, two copies of the test protocol shall be submitted: one complete copy with the confidential information and a second copy for public record with the confidential information masked or removed.

3. PERFORMANCE TESTING

When conducting a performance test, great care must be taken collecting the data. The goal is complete and accurate information at representative conditions. In order to accomplish this, it is essential to coordinate testing with production and maintain contact between the facility and test team throughout the test. The following items are considered additional guidance for the data collection phase beyond the requirements provided in the individual Test Methods:

3.1 Units - Units of data collection shall be consistent with the Test Method and within the test report, and units must also be consistent with previous information supplied for the facility.

3.2 Traverse Distances - The traverse point locations shall be clearly marked on the probe or pitot tube and shall include the port length, when applicable.

3.3 Cyclonic Flow - Testing for the absence of cyclonic gas flow must be performed prior to the test and the results shall be presented in the test report.

3.4 Permanent Data Record Keeping - Non-erasable ink must be used to record data. In the event of an error, the data taker crosses through the erroneous value with a single line, records the correct value above it, and initials the change. Strip charts and data-logger data must be clearly identified with the date, test start/stop times, parameters being recorded concurrently (with a clear and concise method of identifying each), span values, test run number, and individual tracking the data.

3.5 Sample Identification and Handling - All samples and filters must be labeled and uniquely numbered to ensure positive identification throughout the sampling and analysis procedures. Identification shall be provided for each container with the number of the container recorded on the field forms, the chain of custody sheets, and on the analysis data forms. Chain of custody sheets will be updated any time a sample changes hands. This includes samples taken to an in-house laboratory. Samples with limited hold times or requiring special handling, such as refrigeration, must have this information available on the chain of custody sheet.

3.6 Reagent/Filter Preparation - Reagents and pre-weighed filters must have a maintenance record, listing the date, the person by whom it was prepared, and any standardization calculations of reagents. This documentation must be included in the test report.

3.7 Records Retention - Test teams should be aware that the records retention requirement for sources is a minimum of five years. Thus, any field notes, laboratory analysis sheets and original data sheets shall be retained for this period.

3.8 Audit Samples - EPA audit samples provide the opportunity to check the accuracy of the laboratory's analytical procedures and can be initiated by the facility, test company, or Department. The Department shall be notified at least 30 days prior to the test date if either the facility or test company requests audit samples. The laboratory or test company shall call the Department with the analysis results of the audit samples prior to analyzing the performance test samples. If the audit sample results are within the acceptable range, the Department will give approval for the performance test samples to be analyzed. Otherwise, the laboratory will be informed that they do not have the correct results and additional analyses must be attempted.

3.9 Number of Test Runs - In accordance with 40 CFR 60 Section 60.8, each performance test is to consist of three separate test runs, and the arithmetic mean of the results shall apply. "In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the Department's approval, be determined using the arithmetic mean of the results of the two other runs." The Department will not allow one test run to be excluded unless these conditions are met. The allowance to accept two test runs does not apply for regulations outside 40 CFR 60.

3.10 Data Witnessing - The Department attempts to provide a regulatory observer for each performance test. In the event that the Department has approved testing without a regulatory observer present, velocity traverse and Method 5 data sheets, when used, shall be transmitted to the Department by facsimile within 24 hours of completing each test run. In the event that a change to the test procedures is necessary without a regulatory observer present, the test company shall contact the Department for approval prior to proceeding with the unapproved methodology. Unapproved modifications to the approved test methods may result in rejection of the test results.

3.11 Time Keeping - All field data sheets shall document the exact starting and stopping times for each set of data collected.

3.12 Sample Time/Sample Volume - Unless otherwise specified in a Test Method, permit conditions or written approval, the minimum sample time is 60 minutes per test run. When sample volumes are not part of the Test Method, at least 30 dry standard cubic feet (dscf) shall be sampled for each test run.

4. TEST REPORTING

The accuracy of data taken during a performance test is determined by the test report review. This includes copies of all original field data sheets (computer generated copies of the field data may be included but not substituted for original hand-written sheets), clearly labeled strip chart records (may require color copies for clarity), laboratory analyses, calculations and instrument calibrations. Non-detect sample results shall be reported as the detection limit and this value shall be used in emissions calculations.

4.1 Test Reports - Attachment 2 provides a summary of the minimum documentation that the Department will accept in a test report submitted for review and approval. This listing is expanded from EPA document #340/1-91-008, "Manual for Coordinating of VOC Emissions Testing Using EPA Methods 18, 21, 25, and 25A" and applies to all relevant performance tests conducted for regulatory compliance. The test report shall follow this format and input shall be provided for each item. The test report must be submitted within 30 calendar days of the last day of testing unless otherwise specified in permit conditions or regulations. If circumstances prevent report submission within the required time frame, Department approval must be requested as soon as possible. A description of the circumstances will be required for evaluation. Performance tests are normally required to be conducted within a specified time frame. The test is not considered complete until the complete performance test report has been received by KDHE.

4.2 Confidentiality Claims - Any confidentiality claims shall be accompanied by a notice of confidentiality pursuant to K.S.A. 65-3015 that precisely identifies the information that is considered confidential. The notice shall contain sufficient supporting information to allow the Department to evaluate whether such information satisfies the requirements related to trade secrets or how the information could cause substantial harm to the facility's competitive edge. If claiming confidentiality, two copies of the test report shall be submitted: one complete copy with the confidential information and a second copy for public record with the confidential information masked or removed.

5. CONTACT INFORMATION

Mailing address:
KDHE
BAR Permits and Compliance Section
1000 SW Jackson, Suite 310
Topeka, KS 66612

Phone:
(785) 296-6281
(785) 296-1544

Fax:
(785) 291-3953

ATTACHMENT 1

PERFORMANCE TEST PROTOCOL REQUIREMENTS

1. COVER INFORMATION

- Facility name, source ID number, location, and mailing address (if different).
- Manufacturer, model number and unit identification number of equipment tested.
- Air quality permit number.
- Test company name and address.

2. FACILITY INFORMATION

- Facility name, mailing address and physical address of equipment (if different).
- Facility contact name and telephone number.
- General description of overall facility operations.
- Safety precautions and equipment required on site.

3. TEST COMPANY INFORMATION

- Test company name and address.
- Test company contact name and telephone number.
- Laboratory name, address and telephone number.

4. TEST INFORMATION

- Reason for testing (permit condition, MACT, NSPS, etc.) list of all applicable regulations and regulatory requirements.
- Test schedule to include the proposed date and estimated start time of test.
- Types of pollutants to be sampled including applicable emission limits and demonstration requirements.
- Test methods and analysis procedures including methods to be performed concurrently. (Provide a synopsis of each test method, not a copy of each entire test method.)
- Documentation of any proposed variations from the specified procedures and the reason necessary.
- Sampling equipment to be utilized including a schematic diagram of the sampling trains.

5. EMISSION POINT INFORMATION

- Drawing with actual dimensions indicating the exhaust gas flow direction from the process, through the control equipment, and to the emission point.
- Diagram of the stack showing actual dimensions, the sampling locations, and the distances downstream and upstream from flow disturbances per EPA Test Method 1.
- Cross-sectional sketch of the stack at the sampling locations that include the sampling traverse points and port lengths.
- Estimated or measured flue gas conditions at the sampling location including temperature, moisture content, and volumetric flow rate. Specific test methods may require additional estimated parameters such as estimated VOC concentration for EPA Test Method 25A calibration gas selections.

ATTACHMENT 1

PERFORMANCE TEST PROTOCOL REQUIREMENTS

6. CONTROL EQUIPMENT INFORMATION

- Complete description of the emission control system including the manufacturer, model number, rated capacity, rated efficiency and unit identification number.
- Control equipment data to be monitored and recorded during the test to ensure representative operation, who will be responsible for recording the data (facility or test team), the interval over which the data will be recorded and the proposed format.
- Minimum acceptable values of control equipment operating parameters.
- Description of any gas conditioning prior to the control equipment.
- Description of any adjustments to or maintenance procedures performed on the control equipment for the previous six months.
- Description of any modifications or failures since the last performance test.

7. PROCESS EQUIPMENT INFORMATION

- Complete description of the process operation including a process flow sheet, if helpful.
- Type and quantity of raw material being used or products being manufactured by the process.
- Maximum rated capacity of the process.
- Actual maximum achieved capacity of the process. The process or production rate of the process during the tests shall be the maximum allowable rate for which the facility will be permitted to operate.
- Actual operating capacity of the process during the previous six months.
- Normal process operating schedule during a 24-hour operating period.
- Process data to be monitored and recorded during the test to ensure representative operation, the person responsible for recording the data (facility or test team), the interval over which the data will be recorded and the proposed format.

8. QUALITY CONTROL INFORMATION

- Copies of all field data sheets to be used during the test.
- Description of the procedures and forms to be utilized in order to maintain the integrity of the samples collected. The description shall include a sample container numbering scheme, how these numbers are identified on the data sheets, chain of custody records, and what sample holding times (if any) are applicable.
- Statement that calibration sheets for the dry gas meter, pitot tube, nozzle, calibration gases, and any other test equipment will be made available prior to the start of testing.
- Quality assurance for the analytical procedures to be used in the analyses of test samples.

9. RELATIVE ACCURACY TEST AUDITS

- A one page abbreviated protocol is acceptable.
- Should include documentation in Items 1-3, plus additional information listed here.
    a. Reason for testing (permit condition, MACT, NSPS, etc.) list of all applicable regulations and regulatory requirements.
    b. Test schedule to include the proposed date and estimated start time of test.
    c. Types of pollutants to be sampled including applicable emission limits and demonstration requirements.
    d. Documentation of any proposed variations from the specified procedures and the reason necessary.

ATTACHMENT 2

PERFORMANCE TEST REPORT REQUIREMENTS

1. COVER INFORMATION

- Facility name, source ID number, location, and mailing address (if different)
- Manufacturer, model number and unit identification number of equipment tested.
- Test date.
- Test company name and address.

2. CERTIFICATION

- Certification by test team leader as to authenticity of test data.
- Certification by reviewer as to accuracy of test results.

3. TEST INFORMATION

- Reason for testing (permit condition, MACT, NSPS, etc.) list of all applicable regulations and regulatory requirements.
- Type of process and control equipment.
- Type of pollutants sampled.
- List of all applicable regulations and regulatory requirements.
- Test date.
- Project participants and titles (facility representatives, test team members, consultants and regulatory observers).

4. SUMMARY OF RESULTS

- Emission results and comparison with applicable limits and demonstration requirements. Results must be reported in the same units as the emission limit.
- Audit sample results, if applicable.
- Discussion of any errors or anomalies that occurred during the test (facility or test related).

5. PROCESS AND CONTROL EQUIPMENT INFORMATION

- Complete description of the emission control system including the manufacturer, model number, rated capacity, rated efficiency and unit identification number.
- Complete description of the process operation including a process flow sheet, if helpful.
- Actual capacity of the process during the test.

6. SAMPLING AND ANALYTICAL PROCEDURES

- Brief description of test methods utilized.
- Brief description of analytical procedures.
- Description of any procedures that deviated from the specified procedures.

7. APPENDICES

- Complete test results with one complete set of example calculations for each test method or pollutant using actual data.
- Raw field data (copies of originals; computer copies are optional).
- Laboratory reports including chain of custody forms and contact name and phone number.
- Process and control equipment data.
- Test equipment calibration sheets for the dry gas meter, pitot tube, nozzle, calibration gases and any other test equipment utilized.